

=> file reg

FILE 'REGISTRY' ENTERED AT 12:04:26 ON 17 MAY 2002

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STRUCTURE FILE UPDATES: 15 MAY 2002 HIGHEST RN 416838-75-0

DICTIONARY FILE UPDATES: 15 MAY 2002 HIGHEST RN 416838-75-0

TSCA INFORMATION NOW CURRENT THROUGH July 7, 2001

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Calculated physical property data is now available. See HELP PROPERTIES
for more information. See STNote 27, Searching Properties in the CAS
Registry File, for complete details:

<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> d his

(FILE 'HOME' ENTERED AT 10:52:15 ON 17 MAY 2002)

FILE 'REGISTRY' ENTERED AT 10:53:03 ON 17 MAY 2002

L1 143527 S (TI OR TA)/ELS (L) (ZR OR HF OR NB OR V OR AL OR CR OR
L2 2803 S L1 (L) 2/ELC.SUB
L3 66293 S ZR/ELS (L) (TI OR TA OR HF OR NB OR V OR AL OR CR OR NI
L4 1303 S L3 (L) 2/ELC.SUB
L5 11653 S HF/ELS (L) (TI OR TA OR ZR OR NB OR V OR AL OR CR OR NI
L6 402 S L5 (L) 2/ELC.SUB
L7 76918 S NB/ELS (L) (TI OR TA OR ZR OR HF OR V OR AL OR CR OR NI
L8 1529 S L7 (L) 2/ELC.SUB
L9 110 S (TI(L)TA)/ELS (L) 2/ELC.SUB

FILE 'HCA' ENTERED AT 11:07:29 ON 17 MAY 2002

L10 314 S L9
L11 6336 S PHYS?(3A) (VAPOR? OR VAPOUR?) (3A)DEPOSIT?
L12 20537 S L2
L13 6653 S L4
L14 895 S L6
L15 8701 S L8
L16 2 S L10 AND L11
L17 276979 S TARGET?
L18 6 S L10 AND L17
L19 81962 S (CVD OR (CHEMICAL? OR CHEM) (2A) (VAPOR? OR VAPOUR?) (2A)D
L20 0 S L18 AND L19
L21 83 S L12 AND L11
L22 17 S L21 AND L17
L23 19 S L13 AND L11
L24 3 S L23 AND L17

L25 24 S L13 AND L19
L26 1 S L25 AND L17
L27 3 S L14 AND L11
L28 5 S L14 AND L19
L29 1 S (L27 OR L28) AND L17
L30 11 S L15 AND L11
L31 22 S L15 AND L19
L32 3 S (L30 OR L31) AND L17
L33 6 S L18 NOT L16
L34 13 S L24 OR L26 OR L27 OR L28 OR L29 OR L32
L35 8 S L30 NOT L34
L36 12 S L22 NOT (L34 OR L35)

FILE 'REGISTRY' ENTERED AT 12:04:26 ON 17 MAY 2002

=> file hca

FILE 'HCA' ENTERED AT 12:04:37 ON 17 MAY 2002

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FILE COVERS 1907 - 9 May 2002 VOL 136 ISS 20

FILE LAST UPDATED: 9 May 2002 (20020509/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

CAS roles have been modified effective December 16, 2001. Please check your SDI profiles to see if they need to be revised. For information on CAS roles, enter HELP ROLES at an arrow prompt or use the CAS Roles thesaurus (/RL field) in this file.

=> d l34 1-13 cbib abs hitstr hitind

L34 ANSWER 1 OF 13 HCA COPYRIGHT 2002 ACS

136:313544 Metal or alloy **target** bonded to backing plate
assembly for **physical vapor deposition**

of films. Kohler, Ron D.; Cooper, Matthew S. (Honeywell International, Inc., USA). U.S. US 6376281 B1 20020423, 9 pp.
(English). CODEN: USXXAM. APPLICATION: US 2000-699899 20001027.

AB The **target** for **phys.-vapor**

deposition of metal or alloy is bonded to a backing plate assembly by a diffusion interlayer. The bonding interlayer is preferably based on Ti, Zr, or Cu film nominally 2000-4000 .ANG. thick. The assembly optionally includes: (a) diffusion bonding layer on the rear **target** surface; (b) passivating interlayer, esp. Ni film; and (c) solder interlayer in contact with the backing plate. The **target** is optionally made of Ta, Co, Co-Ta-Zr alloy, Co-Pt alloy, Pt, Fe-Ta alloy, Ti-Zr alloy, Co-Nb alloy, Mo, Co-Cr-Pt alloy, Al, Al-Cu-Fe alloy, Fe-Mn alloy, or Fe-Al alloy.

IT 12741-16-1

(**target**, vapor coating from; metal or alloy
target bonded to backing plate assembly for **phys**
vapor deposition)

RN 12741-16-1 HCA

CN Titanium alloy, nonbase, Ti,Zr (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Ti	7440-32-6
Zr	7440-67-7

IC ICM H01L021-44

ICS H01L021-48; H01L021-50

NCL 438118000

CC 56-6 (Nonferrous Metals and Alloys)

ST metal vapor deposition **target** bonding backing plate;
backing plate diffusion bonding metal **target** vapor
deposition

IT Welding of metals

(diffusion, **target**; metal or alloy **target**
bonded to backing plate assembly for **phys**.
vapor deposition)

IT Solders

(interlayer, bonding with; metal or alloy **target** bonded
to backing plate assembly for **phys**. **vapor**
deposition)

IT **Vapor deposition** process

(**phys**., **target**; metal or alloy **target**
bonded to backing plate assembly for **phys**.
vapor deposition)

IT 7440-32-6, Titanium, uses 7440-50-8, Copper, uses 7440-67-7,
Zirconium, uses

(interlayer, bonding with; metal or alloy **target** bonded
to backing plate assembly for **phys**. **vapor**
deposition)

IT 7440-02-0, Nickel, uses

(interlayer, **target** bonding with; metal or alloy
target bonded to backing plate assembly for **phys**
vapor deposition)

IT 7429-90-5, Aluminum, uses 7439-96-5, Manganese, uses 7439-98-7,

Molybdenum, uses 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses 7440-25-7, Tantalum, uses 7440-28-0, Thallium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 11110-23-9 11148-70-2 12609-19-7, Aluminum, iron base 12741-16-1 37354-23-7

(**target**, vapor coating from; metal or alloy
target bonded to backing plate assembly for **phys**
vapor deposition)

L34 X ANSWER 2 OF 13 HCA COPYRIGHT 2002 ACS

136:158581 Semiconductor structure from epitaxial films of compound semiconductors over silicon with buffer layers for microwave communication apparatus. El-Zein, Nada; Ramdani, Jamal; Eisenbeiser, Kurt; Droopad, Ravindranath (Motorola, Inc., USA). PCT Int. Appl. WO 2002009150 A2 20020131, 91 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US22573 20010718. PRIORITY: US 2000-624296 20000724.

AB High quality epitaxial layers of compd. semiconductor materials can be grown overlying large Si wafers by 1st growing an accommodating buffer layer on a Si wafer. The accommodating buffer layer is a layer of monocryst. oxide spaced apart from the Si wafer by an amorphous interface layer of Si oxide. The amorphous interface layer dissipates strain and permits the growth of a high quality monocryst. oxide accommodating buffer layer. Any lattice mismatch between the accommodating buffer layer and the underlying Si substrate is taken care of by the amorphous interface layer. These semiconductor materials have applications involving communications with high frequency signals including intelligent transportation systems such as automobile radar systems, smart cruise control systems, collision avoidance systems, and automotive navigation systems; and electronic payment systems that use microwave or RF signals such as electronic toll payment for various transportation systems including train fares, and toll roads, parking structures, and toll bridges for automobiles.

IT 393581-85-6

(semiconductor structure from epitaxial films of compd. semiconductors over silicon with buffer layers for microwave communication app.)

RN 393581-85-6 HCA

CN Aluminum, compd. with hafnium (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
Hf	x	7440-58-6

Al | x | 7429-90-5

IC ICM H01L

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

IT **Vapor deposition process**
 (chem.; semiconductor structure from epitaxial films of compd. semiconductors over silicon with buffer layers for microwave communication app.)

IT **Vapor deposition process**
 (phys.; semiconductor structure from epitaxial films of compd. semiconductors over silicon with buffer layers for microwave communication app.)

IT 1303-00-0, Gallium arsenide (GaAs), uses 1314-13-2, Zinc oxide (ZnO), uses 1314-96-1, Strontium sulfide (SrS) 1315-09-9, Zinc selenide (ZnSe) 7440-21-3, Silicon, uses 7440-56-4, Germanium, uses 11129-08-1, Aluminum barium oxide 12009-07-3, Barium hafnate (BaHfO₃) 12009-18-6, Barium tin oxide (BaSnO₃) 12009-21-1, Barium zirconate (BaZrO₃) 12029-24-2, Strontium hafnate (SrHfO₃) 12036-39-4, Strontium zirconate (SrZrO₃) 22398-80-7, Indium phosphide (InP), uses 37303-24-5, Barium strontium titanium oxide (Ba₀-1Sr₀-1TiO₃) 37382-15-3, Aluminum gallium arsenide (Al₀-1Ga₀-1As) 39318-19-9, Zirconium phosphide 39354-09-1, Barium gallium oxide 39354-10-4, Barium indium oxide 39354-12-6, Gallium strontium oxide 39354-13-7, Indium strontium oxide 42617-47-0, Aluminum strontium oxide 59989-74-1, Zinc selenide sulfide (ZnSe₀-1S₀-1) 60800-19-3, Aluminum zirconium oxide 61027-35-8, Aluminum hafnium oxide 61711-23-7, Aluminum, compd. with zirconium 106070-23-9, Aluminum indium arsenide (Al₀-1In₀-1As) 106070-25-1, Gallium indium arsenide (Ga₀-1In₀-1As) 106312-00-9, Gallium indium phosphide (Ga₀-1In₀-1P) 110758-38-8, Aluminum gallium indium arsenide phosphide (Al₀-1Ga₀-1In₀-1As₀-1P₀-1) 120862-85-3, Gallium, compd. with zirconium 120961-33-3 133517-36-9, Arsenic gallium oxide 144593-15-7, Hafnium phosphide 146260-13-1, Titanium germanide 147231-73-0, Hafnium indium oxide 150341-71-2, Indium zirconium oxide 153746-66-8, Gallium zirconium oxide 185148-86-1, Phosphorus zirconium oxide 191218-93-6, Titanium arsenide 194205-05-5, Aluminum, compd. with barium 304673-88-9, Barium, compd. with gallium 354566-09-9, Arsenic strontium oxide 354566-10-2, Zirconium arsenide 354566-11-3, Hafnium arsenide 354566-12-4, Arsenic barium oxide 386703-76-0, Gallium indium arsenide (Ga_{0.53}-1In₀-0.47As) 393579-80-1 393581-09-4, Barium arsenide 393581-39-0, Strontium phosphide 393581-84-5 **393581-85-6** 393581-86-7 393581-88-9, Strontium arsenide 393581-89-0 393581-90-3 393581-91-4 393581-92-5, Barium phosphide 393581-93-6 393581-94-7, Arsenic zirconium oxide 393581-95-8, Arsenic hafnium oxide 393581-96-9, Hafnium phosphorus oxide 393581-97-0, Gallium hafnium oxide 393581-98-1, Phosphorus strontium oxide 393581-99-2, Barium phosphorus oxide
 (semiconductor structure from epitaxial films of compd.

semiconductors over silicon with buffer layers for microwave communication app.)

L34 ANSWER 3 OF 13 HCA COPYRIGHT 2002 ACS

135:145853 The process of coating super-fine particles of multi-element thin film. Chou, Chung-Lin; Hsu, Chen-Chun (Taiwan). U.S. Pat. Appl. Publ. US 20010011634 A1 20010809, 7 pp. (English). CODEN: USXXCO. APPLICATION: US 2000-751690 20001228. PRIORITY: TW 2000-89101936 20000203.

AB This invention provides a process for coating super fine ion particles of multiple elements on the surface of a micro router substrate, characteristics of which is that the coating step is operated under low temps. and vacuums. First, raw micro routers are cleaned by electron beams under atm. pressures and room temps., then the raw micro routers are transferred into a vacuum environment, and increase the temp. of the environment. Next, the surface of the micro router is cleaned by ions, then proceed with the coating process. An arc source is used to bombard cations from a **target**, while a filtration net is used to get filtrate of small cation particles. Then, an ion assistant device is operated to further fine the filtrated particles, therefore only super fine ion particles are coated on the surface of the micro router substrates. The coated substance is super fine particle and has good adhesion to the micro router substrate, therefore cutting speed and wear-resistance of the coated micro router has increased, the cutting precision, and the life has also improved. This invention has short process time and successfully coats a thin film with good adhesion to a micro router substrate which can not be easily achieved by conventional technologies.

IT 68467-11-8

(process of coating super-fine particles of multi-element thin film)

RN 68467-11-8 HCA

CN Hafnium alloy, nonbase, Hf,Zr (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Hf	7440-58-6
Zr	7440-67-7

IC C23C014-32

NCL 204192120

CC 76-12 (Electric Phenomena)
Section cross-reference(s): 42, 47, 75

ST **phys vapor deposition** process hafnium
zirconium carbide nitride film

IT **Vapor deposition** process
(**phys.**; process of coating super-fine particles of
multi-element thin film)

IT 68467-11-8

(process of coating super-fine particles of multi-element thin

film)

L34 ANSWER 4 OF 13 HCA COPYRIGHT 2002 ACS

127:227660 Sputtering **target** and vaporization source for rapid manufacture of compound thin film. Hata, Tomonobu (Hata, Tomonobu, Japan). Jpn. Kokai Tokkyo Koho JP 09228037 A2 19970902 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-67001 19960216.

AB The **target** for manuf. of a compd. thin film, e.g. oxide, nitrides, sulfides, carbides, etc., of superconductor ceramics, ferroelec. ceramics, transparent elec. conductors, and optical materials, etc. comprises a metal deriv. (single body, alloy, intermetallic compd., mixt., etc.) and a metal compd. The **target** is not only used for sputtering but also for **phys. vapor deposition**, e.g. laser ablation, reactive deposition, ionization deposition, ion plating, etc. The **target** gives thin films faster than metal-mode reactive sputtering.

IT 12741-16-1
(sputtering **target** and **phys. vapor deposition** source for rapid manuf. of compd. thin film)

RN 12741-16-1 HCA

CN Titanium alloy, nonbase, Ti,Zr (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ti	7440-32-6
Zr	7440-67-7

=====+=====

Ti	7440-32-6
Zr	7440-67-7

IC ICM C23C014-34
ICS C23C014-08; C23C014-24; C23C014-28; C23C014-32

CC 75-1 (Crystallography and Liquid Crystals)

ST faster sputtering **target** metal compd mixt; PVD **target** metal compd mixt

IT **Physical vapor deposition**

Sputtering **targets**

(sputtering **target** and **phys. vapor deposition** source for rapid manuf. of compd. thin film)

IT 12626-81-2P, PZT

(sputtering **target** and **phys. vapor deposition** source for rapid manuf. of compd. thin film)

IT 1317-36-8, Lead oxide (PbO), processes 12741-16-1

(sputtering **target** and **phys. vapor deposition** source for rapid manuf. of compd. thin film)

✓ L34 ANSWER 5 OF 13 HCA COPYRIGHT 2002 ACS

124:322017 Performance evaluation of innovative PVD coatings for different complex-shaped HSS cutting tools. Bugliosi, Sante; Calzavarini, Roberto; Chiara, Ruggero; Guglielmi, Emanuele; Rabezzana, Franco (Istituto Lavorazione Metalli, C.N.R., Orbassano, 10043, Italy). Adv. Sci. Technol., 5(Advances in Inorganic Films

and Coatings), 573-581 (English) 1995. CODEN: ASET5.

AB In past years the techniques of thin film deposition from vapor phase PVD and CVD have further become perfected and sophisticated as regards both the process technologies and the no. and types of industrial applications. In particular from an initial period in which there was a low no. of std. coating types used in all applications, there has been the passage to a period of evolution and diversification of the coating types in terms either of specific application or substrate to be coated. This sequence is evident in the case of PVD processes for cutting tool applications in the appearance, along with the conventional and well tested and inspected titanium nitride (TiN), of new compns. The aim of this paper is to describe the results of machining tests performed with different HSS tools coated with these innovative PVD layers.

IT 176501-95-4, Hafnium 68, titanium 32
(performance evaluation of innovative PVD coatings of nitride of)

RN 176501-95-4 HCA

CN Hafnium alloy, base, Hf 68, Ti 32 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Hf	68	7440-58-6
Ti	32	7440-32-6

CC 55-6 (Ferrous Metals and Alloys)

IT 161063-18-9, Aluminum 56, titanium 44 176501-95-4, Hafnium 68, titanium 32

(performance evaluation of innovative PVD coatings of nitride of)

L34/124:131705 ANSWER 6 OF 13 HCA COPYRIGHT 2002 ACS

Preparation of liquid-crystal display panel. Oonishi, Takashi; Yoshikawa, Kazuo (Kobe Steel Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07294963 A2 19951110 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-86702 19940425.

AB In the title method comprising the steps of forming a thin film for circuit on a substrate by **phys. vapor-deposition**, patterning the thin film to form a thin film circuit, forming a transparent conductive film for transparent picture element electrode by **phys. vapor-deposition**, and patterning the conductive film to form a transparent picture element electrode, the thin film is made of an Al-based alloy contg. Zr and/or Hf at 0.1-10 at.% as the total content. An anodic oxidn. film with thickness .gtoreq.10 nm is formed on the thin film for circuit after patterning by anodic oxidn. and before the formation of the conductive film. The thin film for circuit is made of pure Al or Al-based alloy and the oxide film with thickness .gtoreq.10 nm comprising ZnO2 and/or HfO2 is formed on the surface of the thin film circuit prepd. by patterning. Since the anodic oxidn. film shows good resistance to etchants, only the transparent conductive film is selectively etched and a panel providing defect-free displays is produced in high yields.

IT 74129-51-4
(manuf. of liq. crystal panel comprising aluminum alloy thin film circuit)

RN 74129-51-4 HCA

CN Aluminum alloy, base, Al,Hf (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Hf	7440-58-6

IC ICM G02F001-136

ICS G02F001-1343

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

IT 1314-23-4, Zirconium oxide, uses 12055-23-1, Hafnium oxide.
12609-62-0 74129-51-4

(manuf. of liq. crystal panel comprising aluminum alloy thin film circuit)

L34 X ANSWER 7 OF 13 HCA COPYRIGHT 2002 ACS

113:137359 Manufacture of prestressed, or curved, glass plates provided on the reverse side with a nontransparent, reflective coating, and the plates obtained and their uses. Hoelscher, Heinz W. (Flachglas A.-G., Fed. Rep. Ger.). Ger. Offen. DE 3902596 A1 19900802, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1989-3902596 19890128.

AB In this process, in which 1 side of the plates is provided with a coating consisting primarily of .gtoreq.1 metals or alloys of at. no. 22-28, which coating is coated with a metal-contg. protective layer, after which the plates are thermally prestressed, or bent, in air at 530-680.degree., and the thickness and material of the coating are selected such that no O diffusion to the metal layer takes place during the thermal treatment, the protective layer is an alloy of Al and Ti and/or Zr. The glass may first be coated with an adhesion-promoting layer consisting of .gtoreq.1 of TiO2, Ta2O4, ZrO2, and SiO2. These coatings are scratch- and wear-resistant, and the coated plates are used for the manuf. of rear-view mirrors, facade plates and decorative panels.

IT 12617-57-1

(coating with, in single-side coated curved or prestressed nontransparent reflective glass plate manuf.)

RN 12617-57-1 HCA

CN Aluminum alloy, nonbase, Al,Zr (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Zr	7440-67-7

IC ICM C03C017-34
 ICS C03B023-023; C03B027-00; C03C017-00; C03C023-00; C23C014-22;
 C23C016-44; G02B001-10; E04F013-14; E04B002-88; B60R001-02;
 B32B017-06

CC 57-1 (Ceramics)

ST nontransparent reflective coating glass plate; oxide coating glass
 plate; metal alloy coating glass plate; corona discharge glass
 plate; **chem vapor deposition** glass
 plate; sputtering **target** glass plate; aluminum
target glass plate; titanium **target** glass plate;
 zirconium **target** glass plate; rear view mirror glass
 plate; facade glass plate; decorative panel glass plate

IT 11106-92-6 **12617-57-1** 77044-21-4
 (coating with, in single-side coated curved or prestressed
 nontransparent reflective glass plate manuf.)

IT 7429-90-5, Aluminum, uses and miscellaneous 7440-32-6, Titanium,
 uses and miscellaneous 7440-67-7, Zirconium, uses and
 miscellaneous
 (**targets**, in single-side coated curved or prestressed
 nontransparent reflective glass plate manuf.)

✓ L34 ✓ ANSWER 8 OF 13 HCA COPYRIGHT 2002 ACS
 110.16493 Thermal decomposition **chemical vapor**
deposition of diamond. Tobioka, Masaaki; Ikegaya, Akihiko
 (Sumitomo Electric Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho
 JP 63166797 A2 19880709 Showa, 4 pp. (Japanese). CODEN: JKXXAF.
 APPLICATION: JP 1986-309172 19861227.

AB The title method is characterized by the use of a heater (e.g., at
 1800- 2500.degree.) formed of an alloy of 40-99-wt.% Ta, Zr, and/or
 Hf, which preheats a hydrocarbon-H2 mixt., before thermal decompn.
 of the hydrocarbon. A diamond film 10-.mu.m-thick was formed on a
 WC-5.5-wt.% Co substrate at 1050.degree. from a H2-2% CH4 mixt.
 supplied at 150 torr in 1 h, by using a heater from a wire of
 Ta-20-at.% Zr heated at 2400.degree..

IT **117915-07-8**
 (heater from, for thermal decompn. **chem. vapor**
deposition of diamond)

RN 117915-07-8 HCA
 CN Tantalum alloy, base, Ta 95,Hf 4.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ta	95	7440-25-7
Hf	4.5	7440-58-6

IC ICM C30B029-04
 CC 75-1 (Crystallography and Liquid Crystals)
 ST diamond thermal decompn **chem vapor**
deposition; tantalum zirconium hafnium alloy heater

IT Heating systems and Heaters
 (alloy-formed, in thermal decompn. **chem. vapor**)

deposition of diamond)
 IT 117915-06-7 117915-07-8 117915-08-9
 (heater from, for thermal decompn. **chem. vapor**
deposition of diamond)
 IT 7782-40-3, Diamond, uses and miscellaneous
 (thermal decompn. **chem. vapor**
deposition of, alloy-formed heater in)

L34 ~~X~~ ANSWER 9 OF 13 HCA COPYRIGHT 2002 ACS

107:227508 **Chemical vapor deposition** of

superconducting films. Kanai, Masahiro; Hirooka, Masaaki; Hanna, Junichi; Shimizu, Isamu (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 62142780 A2 19870626 Showa, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-285280 19851218.

AB The title method involves introduction of .gtoreq.1 source gas and a halide oxidizing gas, and supply of .gtoreq.1 excited precursor product formed to the deposition space to form a superconducting metal, compd., or alloy film. Nb(MeO)5, Ti(MeO)4, and F2 were supplied to a reaction chamber at 0.9 torr with He carrier gas through an inner, a middle, and an outer pipe, resp. A Nb-Ti film was deposited on a quartz glass at 550.degree. in substrate temp.; the film had a deviation of the thickness distribution <3% and a superconducting transition temp. at 11 K.

IT 68467-11-8

(**chem. vapor deposition** of
 superconducting films of)

RN 68467-11-8 HCA

CN Hafnium alloy, nonbase, Hf,Zr (9CI) (CA INDEX NAME)

Component Component
 Registry Number

=====+=====

Hf 7440-58-6

Zr 7440-67-7

IC ICM C23C016-44

ICS C23C016-30; G03G005-08; H01L021-205; H01L031-04

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 75

ST niobium titanium alloy superconductor film deposition;
 superconductor film **chem vapor**
deposition

IT Superconductors

(**chem. vapor deposition** of)

IT Halides

(in **chem. vapor deposition** of
 superconductor films)

IT 7439-92-1, Lead, uses and miscellaneous 7440-03-1, Niobium,
 properties 7440-62-2, uses and miscellaneous 11105-54-7

11105-55-8 11130-73-7, Tungsten carbide (unspecified) 12069-94-2

12648-34-9 12653-77-9 12668-49-4 12683-47-5 12687-87-5

37256-24-9 39305-80-1 39396-75-3 39399-09-2 51428-02-5,

Aluminum, germanium, niobium 52896-73-8 57140-72-4
 68467-11-8 69255-79-4

(chem. vapor deposition of
 superconducting films of)

IT 7782-41-4, Fluorine, uses and miscellaneous
 (in chem. vapor deposition of
 superconductor films)

✓ 34 ANSWER 10 OF 13 HCA COPYRIGHT 2002 ACS

102:189090 Properties and production of powder-metallurgical PVD
 sources. Eck, Ralf; Eiter, Hans; Roedhammer, Peter (Metallwerk
 Plansee G.m.b.H., Reutte/Tirol, A-6600, Austria). Erzmetall, 38(3),
 129-33 (English) 1985. CODEN: ERZMAK. ISSN: 0044-2658.

AB To achieve an optimum combination of (phys. vapor
 deposition) target properties for sputtering or
 ion plating such as homogeneous compn., low level of detrimental
 impurities, low gas content, high d., and min. flake formation,
 powder-metallurgy methods are desirable. With Mo as an example, the
 typical powder-metallurgy prodn. methods using powder treatment,
 compaction, and sintering are discussed. Relevant properties of
 Mo-1Si, Cr, Cr-Ni, Cr-Fe, W, Re, W-Re, W-10Ti, Ta, Nb, and Ta-50Nb
 for targets are considered.

IT 12701-02-9P

(ion plating and sputtering targets of, powder
 metallurgy prepn. of)

RN 12701-02-9 HCA

CN Niobium alloy, base, Nb 50, Ta 50 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Nb	50	7440-03-1
Ta	50	7440-25-7

CC 56-4 (Nonferrous Metals and Alloys)

ST sputtering target powder metallurgy prepn; coating
 target powder metallurgy prepn; molybdenum target
 powder metallurgy prepn

IT Sputtering
 (app., targets, properties and powder metallurgy prodn.
 of)

IT Coating process
 (ion, targets for, properties and powder metallurgy
 prodn. of)

IT 7439-98-7P, uses and miscellaneous 7440-03-1P, uses and
 miscellaneous 7440-15-5P, uses and miscellaneous 7440-25-7P,
 uses and miscellaneous 7440-33-7P, uses and miscellaneous
 7440-47-3P, uses and miscellaneous 11125-18-1P 11125-20-5P
 12701-02-9P 37230-67-4P 58397-70-9P 87413-96-5P
 92839-33-3P

(ion plating and sputtering targets of, powder
 metallurgy prepn. of)

L34 ~~X~~ ANSWER 11 OF 13 HCA COPYRIGHT 2002 ACS

101:135340 Properties and production of powder metallurgical PVD sources. Eck, Ralf; Eiter, Hans; Roedhammer, Peter (Metallwerk Plansee G.m.b.H., Reutte/Tirol, A-6600, Austria). Int. J. Refract. Hard Met., 3(2), 92-5 (English) 1984. CODEN: IJRMD5. ISSN: 0263-4368.

AB To achieve an optimum combination of **phys. vapor deposition** (PVD) **target** properties for sputtering or ion plating such as homogeneous compn., low level of detrimental impurities, low gas content, high d., and min. formation of flakes, powder metallurgy methods were used. With Mo as an example, the typical powder metallurgy prodn. by powder treatment, compaction, and sintering was discussed. Relevant properties of Mo-1Si [87413-96-5], Cr, Cr-Ni, Cr-Fe, W, W-Re, W-10Ti [58397-70-9], Ta, Nb, and Ta-50Nb [12701-02-9] are discussed.

IT 12701-02-9P

(powder metallurgy prodn. of, for **phys.-vapor deposition** source)

RN 12701-02-9 HCA

CN Niobium alloy, base, Nb 50, Ta 50 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Nb	50	7440-03-1
Ta	50	7440-25-7

CC 56-6 (Nonferrous Metals and Alloys)

ST sputtering **target** powder metallurgy prep; coating source
powder metallurgy prep; powder metallurgy **phys**
vapor deposition

IT Sputtering
(app., **targets**, powder metallurgy prep. of metal)

IT 7439-98-7P, uses and miscellaneous 7440-03-1P, uses and
miscellaneous 7440-25-7P, uses and miscellaneous 7440-33-7P,
uses and miscellaneous 7440-47-3P, uses and miscellaneous
11110-93-3P 11122-74-0P 12649-90-0P 12701-02-9P
58397-70-9P 87413-96-5P

(powder metallurgy prodn. of, for **phys.-vapor deposition** source)

L34 ~~X~~ ANSWER 12 OF 13 HCA COPYRIGHT 2002 ACS

99:162491 Properties and production of powder-metallurgical PVD sources. Eck, Ralf; Eiter, Hans; Roedhammer, Peter (Metallwerk Plansee G.m.b.H., Reutte/Tirol, A-6600, Austria). Proc. Int. Conf. Vac. Metall., 7th, Volume 1, 725-32. Iron Steel Inst. Jpn.: Tokyo, Japan. (English) 1982. CODEN: 50DVA9.

AB Powder metallurgy methods achieve an optimum combination of metal **target** properties for sputtering or ion plating. The properties include homogeneous compn., high purity, high d., and low flake formation. Prodn. of Mo **phys. vapor**

deposition (PVD) **targets** was done by powder treatment, compaction, and sintering. Relevant properties of Mo-1Si [87413-96-5], Cr, Cr-Ni, W, W-Re, W-10Ti [58397-70-9], Ta, Nb, and Ta-Nb for **targets** are discussed.

IT 37256-00-1

(**targets** of, for **phys. vapor deposition**, powder metallurgy prodn. of)

RN 37256-00-1 HCA

CN Niobium alloy, nonbase, Nb,Ta (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Nb	7440-03-1
----	-----------

Ta	7440-25-7
----	-----------

CC 56-4 (Nonferrous Metals and Alloys)

ST molybdenum sputtering **target** powder metallurgy

IT Sputtering

(app., **targets**, powder metallurgy prodn. of)

IT 7439-98-7, uses and miscellaneous 7440-03-1, uses and
miscellaneous 7440-25-7, uses and miscellaneous 7440-33-7, uses
and miscellaneous 7440-47-3, uses and miscellaneous 11105-45-6
11110-93-3 37256-00-1 58397-70-9 87413-96-5

(**targets** of, for **phys. vapor deposition**, powder metallurgy prodn. of)

L34 ANSWER 13 OF 13 HCA COPYRIGHT 2002 ACS

85/147447 Research with in-situ composites aligned with eutectoid and eutectic transformations. Smeggil, J. G. (Gen. Electr. Corp. Res. Dev., Schenectady, N. Y., USA). U. S. NTIS, AD Rep., AD-A021530, 153 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U. S.) 1976, 76(9), 124 (English) 1975. CODEN: XADRCH.

AB Directionally aligned eutectoids are of potential interest for high-temp. turbine applications. The Hf-HfCr₂ eutectoid was selected to explore the potential of using solid-solid transformation to yield a suitable, aligned microstructure. A series of Ni-TaC alloys and a Ni-Cr-Ni₃Al-Ni₃Nb alloy were examd. in oxidn. Numerous effects dependent on microstructures, chem. and oxidn. temp. were obsd. **Chem. vapor deposition** was used to deposit simple and complex layers of Ni, Cr, and Al required for high temp. oxidn. resistant coatings. Feasibility of depositing sequential layers was demonstrated.

IT 60590-91-2

(in-situ composites aligned by eutectoid transformation of)

RN 60590-91-2 HCA

CN Hafnium alloy, base, Hf,Cr (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Hf	7440-58-6
----	-----------

Cr 7440-47-3

CC 56-5 (Nonferrous Metals and Alloys)

IT 60590-91-2

(in-situ composites aligned by eutectoid transformation of)

=> d 135 1-8 cbib abs hitstr hitind

L35 ANSWER 1 OF 8 HCA COPYRIGHT 2002 ACS

132:169748 Multilayer composites for wear-resistant coatings suitable for tools and dies. Vereschaka, Alexei Anatolievich; Pchelintsev, Anatoly Konstantinovich; Vereschaka, Anatoly Stepanovich; Sinitsin, Viktor Sergeevich; Lastochkin, Sergei Sergeevich; Lapin, Valery Fedorovich; Dodonov, Alexandr Igorevich (Russia). PCT Int. Appl. WO 2000008234 A1 20000217, 18 pp. DESIGNATED STATES: W: NO, RU, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-RU255 19980805.

AB The multilayer coating with increased wear resistance contains: (a) bonding layer contg. the elements from substrate and coating layer; (b) transition layer based on Group IVB, VB, and/or VIB metal compds.; (c) alternating layers of refractory metal alloys and compds. with and without Al; and (d) optional top coating. The bonding layer optionally contains Ti, Zr, V, Cr, and/or Al. The hard multilayer coating is typically applied by vapor deposition and/or sputtering, is suitable for cutting tips, and has the thickness related to the tool radius. The WC-5 TiC-10% Co alloy cutting tips having the edge radius of .apprx.30 .mu.m are typically coated by vapor deposition with: (a) Ti and Cr for the bonding layer 0.8 .mu.m thick; (b) Ti-Cr nitride as the transition layer; and (c) alternating layers of Ti-Cr-Al nitride and Ti nitride, for the total coating thickness of 2-12 .mu.m. The multilayer hard coating on tools in cutting of steel increased the service life by nominally 2.5-3.0 times of the single-coating tool.

IT 37352-32-2

(coating layers with; multilayer coating for wear-resistant finish on cutting tools from hard alloys)

RN 37352-32-2 HCA

CN Niobium alloy, base, Nb,Zr (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Nb	7440-03-1
Zr	7440-67-7

IC ICM C23C030-00

CC 56-4 (Nonferrous Metals and Alloys)

Section cross-reference(s): 57

IT Vapor deposition process

(phys., hard coating by; multilayer coating for

wear-resistant finish on cutting tools from hard alloys)
 IT 12621-17-9 12650-25-8 25583-20-4, Titanium nitride (TiN)
 25658-42-8, Zirconium nitride (ZrN) 37352-32-2
 39302-39-1, Niobium zirconium nitride 39402-02-3 157858-44-1,
 Aluminum chromium titanium nitride 173721-22-7, Chromium zirconium
 nitride
 (coating layers with; multilayer coating for wear-resistant
 finish on cutting tools from hard alloys)

L35 ✓ ANSWER 2 OF 8 HCA COPYRIGHT 2002 ACS

131:302225 Multilayer-coating made of solid material. Fleischer,
 Werner; Trinh, Thong (Hauzer Industries B.V., Venlo, Neth.). Ger.
 Offen. DE 19816491 A1 19991021, 4 pp. (German). CODEN: GWXXBX.
 APPLICATION: DE 1998-19816491 19980414.

AB The coating, suitable for tool use, esp. for dry treatment,
 comprises a single or multilayer coating of nitrides, carbides, or
 carbonitrides of the metals Ti, Zr, Nb, Cr, TiAl, and/or TiNb with a
 top coat of the Me-C:H type, preferably 0.5-4 .mu.m thick. An
 interface between the top coat and the multilayer, preferably of W,
 Ti, Nb, Zr, or Cr, may be used. The layers may be **deposited**
 by **phys. vapor deposition** means,
 specifically arc or sputter processes.

IT 11147-74-3

(multilayer-coating made of solid material)

RN 11147-74-3 HCA

CN Niobium alloy, base, Nb 66, Ti 34 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Nb	66	7440-03-1
Ti	34	7440-32-6

IC ICM C23C028-00

ICS C23C030-00; C23C014-06

CC 56-4 (Nonferrous Metals and Alloys)

IT **Vapor deposition** process.

(**phys.**; multilayer-coating made of solid material)

IT 7440-03-1, Niobium, uses 7440-32-6, Titanium, uses 7440-33-7,
 Tungsten, uses 7440-47-3, Chromium, uses 7440-67-7, Zirconium,
 uses 11147-74-3 12003-96-2, AlTi 12385-15-8, Carbide
 (multilayer-coating made of solid material)

✓ L35 ANSWER 3 OF 8 HCA COPYRIGHT 2002 ACS

131:147553 Electron-beam **physical vapor**

deposition of microlaminate composites. Ludtke, H. L.;

Lucas, G. E.; Levi, C. G.; Bujanda, G. L.; Matzen, J. T. (Dept. of
 Chemical Engineering, University of California at Santa Barbara,
 USA). EPD Congress 1999, Proceedings of Sessions and Symposia held
 at the TMS Annual Meeting, San Diego, Feb. 28-Mar. 4, 1999, 147-155.
 Editor(s): Mishra, Brajendra. Minerals, Metals & Materials Society:
 Warrendale, Pa. (English) 1999. CODEN: 67RWA4.

AB The microlaminate composites fabricated by electron-beam **phys. vapor deposition** consisted of 5 layers, each 2-4 .mu.m thick, and composed of either pure metal layers (Cu-Ag), or alternated between metal and intermetallic layers (Nb(Al)-Nb3Al). The microlaminates were heat treated in Ar for 2-12 h at 600.degree. for the Cu-Ag and 1000-1200.degree. for the Nb(Al)-Nb3Al. Microlaminates were examd. after deposition and after heat treatment by SEM and energy dispersive x-ray spectrometry. The effects of heat treatment on the morphol. stability of these composites is described.

IT 12003-75-7 33606-91-6

(electron-beam **phys. vapor deposition** of microlaminate composites and heat-treatment effect on their morphol. stability)

RN 12003-75-7 HCA

CN Aluminum, compd. with niobium (1:3) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====		
Nb	3	7440-03-1
Al	1	7429-90-5

RN 33606-91-6 HCA

CN Aluminum, compd. with niobium (1:1) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====		
Nb	1	7440-03-1
Al	1	7429-90-5

CC 56-4 (Nonferrous Metals and Alloys)

Section cross-reference(s): 76, 77

ST electron beam **phys vapor deposition**

microlaminate; copper silver microlaminate deposition heat treatment; aluminum niobium aluminide microlaminate deposition heat treatment

IT Composites

(electron-beam **phys. vapor deposition** of microlaminate composites and heat-treatment effect on their morphol. stability)

IT 7440-22-4, Silver, processes 7440-50-8, Copper, processes

12003-75-7 33606-91-6

(electron-beam **phys. vapor deposition** of microlaminate composites and heat-treatment effect on their morphol. stability)

L35 ~~ANSWER 4 OF 8~~ HCA COPYRIGHT 2002 ACS

131:123306 Heat-resistant diamond particles. Saita, Junji; Niiyama, Masato; Tanaka, Yosuke; Takeshima, Eiki (Nisshin Steel Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11189492 A2 19990713 Heisei, 7

pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-366254
19971225.

AB The diamond particles are coated with a metal of Ti, Zr, Hf, V, Nb, Ta, Cr, and/or Mo or their alloy by **phys. vapor deposition**, or are coated with an oxide, nitride, or carbide of B, Si, or Al besides the oxide, nitride, or carbide of Ti, etc. by sputter deposition. The amt. of the coating is .gtoreq.20 wt.% in a case of 30-60 .mu.m-diametral diamond particles, and is .gtoreq.40 wt.% in a case of 1-30 .mu.m-diametral diamond particles so that all of the surface of each diamond particle is coated. The diam. of the crystals of the coating layer is controlled at .ltoreq.200 nm, so that the thermal stress of the coating layer is eased by the slip between the fine crystals. A cutting tool, for example, is made from the diamond particles by sintering the diamond particles, for example. The diamond particles are heat resistant because of the coating and become graphite hardly, and come off the cutting tool hardly.

IT 12695-74-8

(coating; diamond particles with metal (oxide, nitride, or carbide) coating with heat resistance)

RN 12695-74-8 HCA

CN Niobium alloy, base, Nb 50, V 50 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Nb	50	7440-03-1
V	50	7440-62-2

IC ICM C30B029-04

ICS C23C014-06; C23C014-08; C23C014-14; C23C014-18

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 42, 56, 57

ST heat resistant coated diamond particle; **phys vapor deposition** diamond coating; sputter deposition diamond particle coating

IT **Vapor deposition** process

(**phys.**; for diamond particles with metal (oxide, nitride, or carbide) coating with heat resistance)

IT 409-21-2, Silicon carbide, properties 1344-28-1, Aluminum oxide (Al₂O₃), properties 7439-98-7, Molybdenum, properties 7440-03-1, Niobium, properties 7440-25-7, Tantalum, properties 7440-32-6, Titanium, properties 7440-33-7, Tungsten, properties 7440-47-3, Chromium, properties 7440-58-6, Hafnium, properties 7440-62-2, Vanadium, properties 7440-67-7, Zirconium, properties 7631-86-9, Silica, properties 10043-11-5, Boron nitride, properties 11068-94-3, Zircaloy 2 12033-62-4, Tantalum nitride 12033-89-5, Silicon nitride, properties 12069-89-5, Molybdenum carbide (Mo₂C) 12070-06-3, Tantalum carbide 12070-08-5, Titanium carbide 12695-74-8 12701-27-8 12705-37-2, Chromium nitride 13463-67-7, Titania, properties 24304-00-5, Aluminum nitride 24621-21-4, Niobium nitride 24646-85-3, Vanadium nitride

25583-20-4, Titanium nitride 25658-42-8, Zirconium nitride
 25817-87-2, Hafnium nitride 37245-81-1, Molybdenum nitride
 58923-53-8 61143-67-7 65666-56-0, Titanium zirconium nitride
 73883-15-5 113151-72-7, Aluminum titanium nitride 116666-18-3,
 Chromium vanadium nitride 118705-51-4 232284-84-3 232284-90-1
 232284-94-5, Niobium vanadium nitride 232284-96-7, Molybdenum
 titanium zirconium nitride
 (coating; diamond particles with metal (oxide, nitride, or
 carbide) coating with heat resistance)

L35/ANSWER 5 OF 8 HCA COPYRIGHT 2002 ACS

120:197333 Aluminum-niobium alloy-coated metals. Terada, Makoto;
 Kihara, Atsushi; Araga, Kunyasu (Kobe Steel Ltd, Japan). Jpn. Kokai
 Tokkyo Koho JP 06002109 A2 19940111 Heisei, 8 pp. (Japanese).
 CODEN: JKXXAF. APPLICATION: JP 1992-184338 19920617.

AB Metal substrates are coated with an Al-(1-50%) Nb alloy which
 contains Al₃Nb and has a tapering compn. with Nb high in the inner
 layer and low at the surface. The coating is formed by vapor
 depositing of Nb and Al from sep. vapor sources on a metal substrate
 at .ltoreq.10-2 torr, the substrate is preheated to 80-550.degree..
 The coating is tenacious and has increased corrosion and heat
 resistance. Steel sheets were thus coated.

IT 12004-70-5, Al₃Nb
 (coating contg., on steel sheets, for corrosion and heat
 resistance)

RN 12004-70-5 HCA

CN Aluminum, compd. with niobium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Nb	1	7440-03-1
Al	3	7429-90-5

IC ICM C23C014-14

ICS C23C028-02; C23C030-00

CC 55-6 (Ferrous Metals and Alloys)

IT Vapor deposition processes

(phys., of aluminum and niobium, with formation of
 coating having tapering compns., for corrosion and heat
 resistance)

IT 7429-90-5, Aluminum, miscellaneous 7440-03-1, Niobium,
 miscellaneous 12004-70-5, Al₃Nb
 (coating contg., on steel sheets, for corrosion and heat
 resistance)

L35/ANSWER 6 OF 8 HCA COPYRIGHT 2002 ACS

118:9768 The coating of internal surfaces by PVD techniques. Sheward,
 J. A. (DRA, Sevenoaks/Kent, TN14 7BP, UK). Surf. Coat. Technol.,
 54-55(1-3), 297-302 (English) 1992. CODEN: SCTEEJ. ISSN:
 0257-8972.

AB The development of a PVD technique for the coating of steel tubes is

described. Expts. were conducted using small samples both planar and rifled, mounted in trapezoidal slots within a 120 mm bore, stainless steel tube. Various plasma etching techniques, using d.c., radio-frequency, and reactive etching with hydrogen chloride contg. gases, were investigated to remove damaged surface layers and matching marks from the samples. D.c. argon sputtering was the most satisfactory method. A triode sputter ion plating system was developed in which an axial d.c. post magnetron was used to coat both small samples and gun steel sections with chromium, niobium, and a chromium-niobium alloy. Variations in coating thickness and structure on rifled substrates were investigated. Further development is necessary to increase deposition rates and to obviate certain effects produced by the magnetic field of the post magnetron.

IT 39460-27-0

(**phys.-vapor deposition** of, in
steel tube interiors)

RN 39460-27-0 HCA

CN Chromium alloy, nonbase, Cr,Nb (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Cr	7440-47-3
----	-----------

Nb	7440-03-1
----	-----------

CC 55-6 (Ferrous Metals and Alloys)

ST steel tube interior vapor deposition; **phys vapor deposition** tube interior; chromium deposition steel tube interior; niobium deposition steel tube interior; tantalum deposition steel tube interior; tungsten deposition steel tube interior

IT Pipes and Tubes
(steel, **phys.-vapor deposition** of
metals in interior of)

IT 39460-27-0

(**phys.-vapor deposition** of, in
steel tube interiors)

IT 7440-03-1, Niobium, miscellaneous 7440-25-7, Tantalum,
miscellaneous 7440-33-7, Tungsten, miscellaneous 7440-47-3,
Chromium, miscellaneous

(**phys.-vapor deposition** of, in
steel tube interiors)

IT 12597-69-2

(pipes and Tubes, steel, **phys.-vapor deposition** of metals in interior of)

L35/ ANSWER 7 OF 8 HCA COPYRIGHT 2002 ACS

109:84636 Formation of a superconductor using vapor deposition.

Yoshizaki, Kiyoshi (Mitsubishi Electric Corp., Japan). Jpn. Kokai
Tokkyo Koho JP 63029415 A2 19880208 Showa, 4 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 1986-171180 19860721.

AB A multilayer film formed by alternately laminating a filamentary superconductor layer (e.g., Nb₃Sn, V₃Ga, Nb₃Al, Nb₃Ge, Nb₃Ga, or NbN) and a normal elec. conductive layer on a substrate (e.g., a metal or a ceramic) is prepd. using chem. or **phys. vapor deposition**. Preferably, the superconductor and the ordinary elec. conductive layers are prepd. by chem. vapor deposition. The superconductors are useful in magnetic coils.

IT 12003-75-7
(superconductive laminate with layers from)

RN 12003-75-7 HCA

CN Aluminum, compd. with niobium (1:3) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
Nb	3	7440-03-1
Al	1	7429-90-5

IC ICM H01B013-00

ICA B32B009-00; C23C010-28; C23C014-06; C23C014-34; C23C016-30; C23C016-34; H01B012-06

CC 76-4 (Electric Phenomena)
Section cross-reference(s): 56

ST niobium tin compd superconductor prepn; vanadium gallium compd superconductor prepn; aluminum niobium compd superconductor prepn; germanium niobium compd superconductor prepn; nitrogen niobium compd superconductor prepn; chem vapor deposition compd superconductor prepn; **phys vapor deposition** compd superconductor prepn

IT 7440-50-8, Copper, uses and miscellaneous 12003-75-7
12024-05-4 12024-15-6 12025-22-8 12035-04-0 24621-21-4
(superconductive laminate with layers from)

✓ L35 ANSWER 8 OF 8 HCA COPYRIGHT 2002 ACS
108:9833 Preparation of superlattice by PVD methods. Shen, Yuanhua (Dep. Phys., Fudan Univ., Shanghai, Peop. Rep. China). Zhenkong Kexue Yu Jishu, 7(1), 35-41 (Chinese) 1987. CODEN: CKKSDV. ISSN: 0253-9748.

AB Four **phys. vapor deposition**, PVD, coating plants for making superlattices are introduced, and the special vacuum systems, sample holders, and layer thickness monitoring techniques were described in detail. With these plants, superlattices of V/Fe, NbTi/Ge, Ni/C etc. were deposited from the sources of electron-beam, sputtering-gun, or laser-heated evapn. The measurement results show that good quality superlattices can be made by the PVD methods.

IT 11147-74-3
(superlattice of, with germanium, by **phys.-vapor deposition**)

RN 11147-74-3 HCA

CN Niobium alloy, base, Nb 66, Ti 34 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Nb	66	7440-03-1
Ti	34	7440-32-6

CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 55, 68, 73

ST superlattice **phys vapor deposition**
coating; electron beam vapor deposition superlattice; laser vapor
deposition superlattice; sputtering vapor deposition superlattice;
iron vanadium superlattice vapor deposition; germanium niobium
titanium superlattice vapor deposition; nickel carbon superlattice
vapor deposition

IT Electron beam, chemical and physical effects
Laser radiation, chemical and physical effects
Sputtering
(evapn. by, in **phys.-vapor deposition**
of superlattices)

IT Superlattices
(**phys.-vapor deposition** and prepn.
of)

IT 7440-02-0, Nickel, properties
(superlattice of, with carbon, by **phys.-vapor
deposition**)

IT 11147-74-3
(superlattice of, with germanium, by **phys.-
vapor deposition**)

IT 7440-62-2, Vanadium, properties
(superlattice of, with iron, by **phys.-vapor
deposition**)

IT 7440-44-0, Carbon, properties
(superlattice of, with nickel, by **phys.-vapor
deposition**)

IT 7440-56-4, Germanium, properties
(superlattice of, with niobium compd. with titanium, by
phys.-vapor deposition)

IT 7439-89-6, Iron, properties
(superlattice of, with vanadium, by **phys.-vapor
deposition**)

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L36 ~~X~~ ANSWER 1 OF 12 HCA COPYRIGHT 2002 ACS

136:78320 Method of manufacturing a gate in a semiconductor device to
give low leakage current and a low threshold voltage. Park, Dae Gyu
(S. Korea). U.S. Pat. Appl. Publ. US 20020001906 A1 20020103, 5 pp.
(English). CODEN: USXXCO. APPLICATION: US 2001-882103 20010615.
PRIORITY: KR 2000-35691 20000627.

AB A method of manufg. a gate in a semiconductor device is disclosed.
The method forms a TiAlN film as a barrier layer between a gate

insulating film and a metal gate by CVD method or PVD method resulting in the prevention of a leakage current and the obtaining of a low threshold voltage.

IT 11106-92-6

(method of manufg. gate in semiconductor device to give low leakage current and low threshold voltage)

RN 11106-92-6 HCA

CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
Al	7429-90-5
Ti	7440-32-6

=====+=====

IT 384379-08-2, Aluminum 5-35, titanium 65-95

(**target**; method of manufg. gate in semiconductor device to give low leakage current and low threshold voltage)

RN 384379-08-2 HCA

CN Titanium alloy, base, Ti 65-95,Al 5-35 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ti	65 - 95	7440-32-6
Al	5 - 35	7429-90-5

=====+=====+=====

IC ICM H01L021-336

ICS H01L021-3205; H01L021-4763

NCL 438287000

CC 76-3 (Electric Phenomena)

IT Vapor deposition process

(**phys.**; method of manufg. gate in semiconductor device to give low leakage current and low threshold voltage)

IT 75-24-1, Trimethylaluminum 3275-24-9 7446-70-0, Aluminum chloride (AlCl₃), processes 7550-45-0, Titanium chloride (TiCl₄), processes 7782-44-7, Oxygen, processes 10028-15-6, Ozone, processes 11106-92-6

(method of manufg. gate in semiconductor device to give low leakage current and low threshold voltage)

IT 384379-08-2, Aluminum 5-35, titanium 65-95

(**target**; method of manufg. gate in semiconductor device to give low leakage current and low threshold voltage)

L36 ~~X~~ANSWER 2 OF 12 HCA COPYRIGHT 2002 ACS

134:45487 Hot isostatic pressing of high density sputtering **targets** for semiconductor device fabrication. Lo, Chi-Fung; Draper, Darryl; Gilman, Paul S. (Praxair S.T. Technology, Inc., USA). U.S. US 6165413 A 20001226, 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-349666 19990708.

AB The method is esp. suitable for prepg. sputter **targets** with a radius to thickness ratio of .gtoreq.3 and a d. of

.gtoreq.96% of theor. for use in **phys. vapor deposition** of thin films onto complex integrated circuits and other electronic components. A pre-blende powder is pre-packed by hot pressing or vibration between metal plates, followed by hot isostatic pressing at 1000-1600.degree. under the pressure of 0.5-3 ksi for 1-8 h. The powder bed is selected from Al-Ti, Cr-Cu, W-SiN, Ta-Al, or Co-Cr alloys and silicides.

IT 11106-92-6 37239-25-1

(fabrication of high d. sputtering **targets** by hot isostatic pressing of)

RN 11106-92-6 HCA

CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Ti	7440-32-6

RN 37239-25-1 HCA

CN Aluminum alloy, nonbase, Al,Ta (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Ta	7440-25-7

IC ICM B22F003-15

NCL 419049000

CC 56-4 (Nonferrous Metals and Alloys)

Section cross-reference(s): 76

ST sputtering **target** powder hot isostatic pressing density

IT Sputtering **targets**

(fabrication of high d. sputtering **targets** by hot isostatic pressing)

IT Silicides

(fabrication of high d. sputtering **targets** by hot isostatic pressing of)

IT Semiconductor device fabrication

(hot isostatic pressing of high d. sputtering **targets** for)

IT Films

Integrated circuits

(hot isostatic pressing of high d. sputtering **targets** for manuf. of)

IT Sintering

(hot isostatic pressing; fabrication of high d. sputtering **targets** by)

IT 11099-27-7 11106-92-6 11114-92-4 37239-25-1

117937-74-3

(fabrication of high d. sputtering **targets** by hot

isostatic pressing of)

L36 X ANSWER 3 OF 12 HCA COPYRIGHT 2002 ACS

133:316418 Fast and reliable metal line deposition process for semiconductor device fabrication. Schmidbauer, Sven; Weber, Stefan J.; Weigand, Peter; Clevenger, Larry; Iggulden, Roy (Infineon Technologies North America Corp., USA; International Business Machines Corp.). U.S. US 6136709 A 20001024, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-413265 19991006.

AB A method for depositing metal lines for semiconductor devices, in accordance with the present invention includes the steps of providing a semiconductor wafer including a dielec. layer formed on the wafer, the dielec. layer having vias formed therein and placing the wafer in a deposition chamber. The method further includes depositing a metal on the wafer to fill the vias in which the metal depositing is initiated when the wafer is at a 1st temp. and the depositing is continued while heating the wafer to a **target** temp. which is greater than the 1st temp. The process increases throughput without sacrificing performance and reliability.

IT 12004-78-3

(less formation of; metal line deposition process for semiconductor devices)

RN 12004-78-3 HCA

CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
Ti	1	7440-32-6
Al	3	7429-90-5

IC ICM H01L021-24
ICS H01L021-4763

NCL 438688000

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75

IT **Vapor deposition** process
(**phys.**; metal line **deposition** process for semiconductor devices)

IT 12004-78-3

(less formation of; metal line deposition process for semiconductor devices)

L36 X ANSWER 4 OF 12 HCA COPYRIGHT 2002 ACS

132:259293 In situ titanium aluminide deposit in high aspect ratio features such as vias and contacts. Cerio, Frank M., Jr. (Tokyo Electron Arizona, Inc., USA; Tokyo Electron Limited). PCT Int. Appl. WO 2000021129 A1 20000413, 26 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US23281 19991006. PRIORITY: US 1998-167363 19981007.

AB A method to deposit a composite metal to form a continuous, smooth film (42) in high aspect ratio features such as vias (40), contacts and/or trenches on a wafer (14) in a single step. Metal atoms are sputtered from a composite **target** (12) contg. a 1st metal and a 2nd metal in a single reaction chamber (9). A **phys. vapor deposition** processes such as ionized **phys. vapor deposition** (IPVD) is preferred. In one embodiment, the 1st metal is Ti and the 2nd metal is Al. The method eliminates a high temp. anneal and results in lower resistivity, a better wetting layer for subsequent deposition and improved control over thickness of the metal layer (42).

IT 12004-78-3P

(indium situ titanium aluminide deposit in high aspect ratio features such as vias and contacts)

RN 12004-78-3 HCA

CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
Ti	1	7440-32-6
Al	3	7429-90-5

IC ICM H01L021-768

ICS H01L021-285; H01L023-532

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 56

IT **Vapor deposition** process

(**phys.**; indium situ titanium aluminide deposit in high aspect ratio features such as vias and contacts)

IT 12004-78-3P

(indium situ titanium aluminide deposit in high aspect ratio features such as vias and contacts)

L36 ~~ANSWER~~ 5 OF 12 HCA COPYRIGHT 2002 ACS

132:225908 Manufacture of high-density intermetallic sputtering **targets** from powder blends by controlled hot pressing. Lo, Chi-fung; Draper, Darryl; Hoo, Hung-lee; Gilman, Paul S. (Sony Corp., Japan; Materials Research Corporation). U.S. US 6042777 A 20000328, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-366453 19990803.

AB The blend of .gtoreq.2 metal powders for an intermetallic compd. is fabricated into a sputtering **target** by: (a) heating in a die to the temp. 100-400.degree. below the m.p. of the lower-melting powder, and holding to form the intermetallic compd. by diffusion alloying; (b) heating to the temp. 50-300.degree. below the m.p. of the intermetallic compd.; and (c) applying pressure for densification of the powd. intermetallic compd., esp. to >90% of theor. d. The typical blend is based on the metal powders having av. particle size <100 .mu.m, and is typically binary (esp. Ti-Al or Ni-Al) or ternary (esp. Al-Ni-Ti). The hot-pressing treatment is

typically applied on the reacted powder mixt. for .gtoreq.1 h at 0.5-10 kpsi under inert atm. The hot-pressed sputtering **targets** are manufd. without intermediate sintering and crushing, and are suitable for **phys.-vapor deposition** of uniform intermetallic films on semiconductor devices. The ternary powder mixt. of Al, Ni, and Ti (with the m.p. of 660, 1455, and 1666.degree. resp.) was heated in a die to 260-560.degree. and held for 1-8 h to form the binary intermetallic compds. AlNi₃, AlTi, and NiTi having the m.p. in the 1310-1385.degree. range, followed by heating to 1010-1260.degree. and pressing for .gtoreq.1 h to increase the d. of powder pack.

IT 11106-92-6
(intermetallic alloy, for sputtering; intermetallic-compd. sputtering **targets** manufd. from powder blends by hot pressing)

RN 11106-92-6 HCA

CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
Al	7429-90-5
Ti	7440-32-6

IT 12003-96-2, AlTi 12004-78-3 12035-60-8
(sputtering with, sintered **target** for; intermetallic-compd. sputtering **targets** manufd. from powder blends by hot pressing)

RN 12003-96-2 HCA

CN Aluminum, compd. with titanium (1:1) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	1	7429-90-5

RN 12004-78-3 HCA

CN Aluminum, compd. with titanium (3:1) (6CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ti	1	7440-32-6
Al	3	7429-90-5

RN 12035-60-8 HCA

CN Nickel, compd. with titanium (1:1) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
Ti	1	7440-32-6
Ni	1	7440-02-0

IC ICM B22F003-12
ICS B22F007-04

NCL 419008000

CC 56-4 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76

ST intermetallic compd sputtering **target** manuf sintering;
sputtering **target** coating semiconductor app; nickel
titanium aluminide sputtering sintered **target**

IT Sputtering **targets**
(intermetallic-compd. sputtering **targets** manufd. from
powder blends by hot pressing)

IT Semiconductor materials
(sputtering of; intermetallic-compd. sputtering **targets**
manufd. from powder blends by hot pressing)

IT Powder metallurgy
(sputtering **targets** by; intermetallic-compd. sputtering
targets manufd. from powder blends by hot pressing)

IT Intermetallic compounds
(sputtering with; intermetallic-compd. sputtering **targets**
manufd. from powder blends by hot pressing)

IT 11099-19-7 **11106-92-6** 11114-55-9 11114-60-6
11114-68-4 11145-71-4 12641-42-8 12661-90-4 12704-26-6
50955-74-3 51637-10-6 56199-40-7 56728-61-1 58169-77-0
(intermetallic alloy, for sputtering; intermetallic-compd.
sputtering **targets** manufd. from powder blends by hot
pressing)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-98-7,
Molybdenum, uses 7440-02-0, Nickel, uses 7440-21-3, Silicon,
uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses
7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4,
Cobalt, uses 7440-50-8, Copper, uses
(powder, sintering blend with; intermetallic-compd. sputtering
targets manufd. from powder blends by hot pressing)

IT 12003-81-5 **12003-96-2**, AlTi **12004-78-3**
12035-60-8 66020-88-0
(sputtering with, sintered **target** for;
intermetallic-compd. sputtering **targets** manufd. from
powder blends by hot pressing)

L36 ANSWER 6 OF 12 HCA COPYRIGHT 2002 ACS

128:260541 Golf club head having hard surface formed by vapor
deposition. Taniguchi, Yaasuaki; Watanabe, Toshiyuki; Yoon, Teho
(Toshiba Tungaloy Co., Ltd., Japan; Taisei Y. K.). Jpn. Kokai
Tokkyo Koho JP 10085370 A2 19980407 Heisei, 4 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1996-249829 19960920.

AB The golf club has a single layer or multilayer coating made of
(semi)metal carbide, nitride, oxide, or their solid soln. at least

on the metallic club face surface, and the coating having higher hardness than the club face is formed by **phys.** or chem. **vapor deposition**. The club shows long flying distance.

IT 53550-31-5, Aluminum 50, titanium 50 (atomic)
(ion plating **target**; golf club head having hard coating formed by vapor deposition)
RN 53550-31-5 HCA
CN Titanium alloy, base, Ti 64,Al 36 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ti	64	7440-32-6
Al	36	7429-90-5

IC ICM A63B053-04
ICS A63B053-04; C23C014-06
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 42, 75
IT Chemical vapor deposition
Ion plating
Physical vapor deposition
(golf club head having hard coating formed by vapor deposition)
IT 7440-32-6, Titanium, processes
(ion plating **target**; golf club head having hard coating formed by vapor deposition)
IT 53550-31-5, Aluminum 50, titanium 50 (atomic)
(ion plating **target**; golf club head having hard coating formed by vapor deposition)

L36X ANSWER 7 OF 12 HCA COPYRIGHT 2002 ACS
121:235647 Titanium aluminum nitride oxide-coated sliding material and its manufacture. Jooji, Uorufu; Hasei, Seiji; Kyota, Fumio (Riken Kk, Japan). Jpn. Kokai Tokkyo Koho JP 06172970 A2 19940621 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-351498 19921209.

AB The sliding material comprises a substrate coated with a Ti-Al-N-O compd. with Vicker's hardness 1000-2000. The coating is formed by PVD method. The coating showed good adhesion to the substrate and good abrasion resistance.

IT 53550-31-5
(ion plating **target**; titanium aluminum nitride oxide sliding material by PVD and its manuf.)

RN 53550-31-5 HCA
CN Titanium alloy, base, Ti 64,Al 36 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ti	64	7440-32-6
Al	36	7429-90-5

IC ICM C23C014-08
ICS F02F005-00; F16J009-26
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 57
IT **Vapor deposition** processes
(**phys.**, titanium aluminum nitride oxide sliding
material by PVD and its manuf.)
IT 53550-31-5
(ion plating **target**; titanium aluminum nitride oxide
sliding material by PVD and its manuf.)

L36 X ANSWER 8 OF 12 HCA COPYRIGHT 2002 ACS
117:256285 Process and apparatus for coating of metals by
physical vapor deposition. Damond,
Eric; Dervieux, Georges; Jacquot, Patrick (Innovatique S. A., Fr.).
Eur. Pat. Appl. EP 489659 A1 19920610, 11 pp. DESIGNATED STATES: R:
BE, CH, DE, ES, GB, IT, LI, LU, NL. (French). CODEN: EPXXDW.
APPLICATION: EP 1991-403288 19911205. PRIORITY: FR 1990-15331
19901206.

AB The coating with metals by **phys.-vapor
deposition** in vacuum involves: (1) evapn. of a
target as the 1st electrode by ion bombardment, optionally
assisted by elec.-arc discharge; and (2) vapor deposition on a metal
substrate having elec. potential of the 2nd electrode. During vapor
deposition the substrate is held at >600.degree. (preferably at
800-1200.degree.), and the **target** is cooled by a flowing
medium for evapn. by sublimation. The typical coating materials are
Ti, Hf, Cr, Ni, B, or W. The process optionally includes
preliminary nitridation, carburization, carbonitridation, or
oxynitridation. Thus, a metal substrate was annealed at 500.degree.
in vacuum, ion nitrided at 850.degree., coated with Ti for TiN layer
at 900.degree., and cooled.

IT 11106-92-6 12682-24-5
(coating with, on metals, **phys.-vapor
deposition** stage in)

RN 11106-92-6 HCA
CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Ti	7440-32-6

RN 12682-24-5 HCA
CN Chromium alloy, nonbase, Cr,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Cr	7440-47-3

Ti 7440-32-6

- IC ICM C23C014-32
- ICS C23C014-54
- CC 56-7 (Nonferrous Metals and Alloys)
- ST coating **phys vapor deposition** app;
titanium vapor deposition coating; nitridation vapor deposition
coating
- IT Carbonitridation and Cyanidation
Carburization
Nitridation
(of metals, **phys.-vapor deposition**
after)
- IT Coating process
(**phys.-vapor deposition**, on metals,
target heating for sublimation in)
- IT Nitridation
(oxy-, of metals, **phys.-vapor**
deposition after)
- IT 12741-57-0, Z38CDV5
(coating of, with metals, **phys.-vapor**
deposition for)
- IT 12597-69-2, Steel, miscellaneous
(coating of, with metals, **phys.-vapor**
deposition for)
- IT 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses 7440-33-7,
Tungsten, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses
7440-47-3, Chromium, uses 7440-58-6, Hafnium, uses 7782-42-5,
Graphite, uses
(coating with, by **phys.-vapor**
deposition on metals, app. and process for)
- IT 12069-32-8, Boron carbide (B4C) 12075-40-0, Chromium carbide
(Cr7C3) 12105-81-6, Chromium carbide (Cr23C6)
(coating with, of carburized metals, **phys.-**
vapor deposition stage in)
- IT 12006-84-7, Iron boride (FeB) 12006-85-8, Iron boride (Fe2B)
(coating with, of metals, **phys.-vapor**
deposition stage in)
- IT 11105-45-6 11106-92-6 11107-19-0 11145-71-4
12682-24-5 12705-37-2, Chromium nitride 25583-20-4,
Titanium nitride (TiN)
(coating with, on metals, **phys.-vapor**
deposition stage in)
- IT 7727-37-9
(nitridation, of metals, **phys.-vapor**
deposition after)
- IT 7727-37-9
(nitridation, oxy-, of metals, **phys.-vapor**
deposition after)

alloy films. Ono, Ichiro; Sato, Shunichi (Casio Computer Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04103758 A2 19920406 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-218928 19900822.

AB The title deposition uses an amorphous alloy **target**. An Al-Ti alloy film may be deposited.

IT 11106-92-6
(**phys. vapor deposition** of)

RN 11106-92-6 HCA

CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
-----------	------------------------------

=====+=====

Al	7429-90-5
----	-----------

Ti	7440-32-6
----	-----------

IC ICM C23C014-14

ICS C30B025-06; H01L021-203; H01L021-285

CC 75-1 (Crystallography and Liquid Crystals)

ST **phys vapor deposition** amorphous alloy **target**

IT **Vapor deposition** processes

(**phys.**, using amorphous alloy **targets**)

IT 11106-92-6

(**phys. vapor deposition** of)

L36 X ANSWER 10 OF 12 HCA COPYRIGHT 2002 ACS

114:211832 Intermetallic matrix composites by **physical vapor deposition**. Hardwick, Dallis A.; Cordi,

Richard C. (Rockwell Sci. Cent., Thousand Oaks, CA, 91360, USA).

Mater. Res. Soc. Symp. Proc., 194 (Intermet. Matrix Compos.), 65-70 (English) 1990. CODEN: MRSPDH. ISSN: 0272-9172.

AB The feasibility of producing layered composite sheet material, in which the matrix is the intermetallic compd. TiAl, was demonstrated using **phys. vapor deposition**. The techniques of sputtering and electron beam evapn. were investigated. Films were deposited by alternately sputtering from **targets** of compn. Ti-53Al-3 at.% Nb and TiB₂ or were co-deposited from sep. electron beam heated hearths contg. Ti and Al. In the latter case, Ni gas was pulsed into the deposition chamber at controlled intervals to form a TiAl/TiAlN layered composite. The compn. of the films was detd. using Auger anal. and RBS, and the crystal structure was checked using x-ray and electron diffraction. Cross-sections through the films were prepd. for examn. by TEM so that the layered microstructure of the films is verified.

IT 12003-96-2P, AlTi

(composites with aluminum titanium nitride, prepn. of, by **phys. vapor deposition**)

RN 12003-96-2 HCA

CN Aluminum, compd. with titanium (1:1) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
Ti	1	7440-32-6
Al	1	7429-90-5

CC 56-4 (Nonferrous Metals and Alloys)

IT 12003-96-2P, AlTi

(composites with aluminum titanium nitride, prepn. of, by
phys. vapor deposition)

IT 12045-63-5P, Titanium diboride

(composites with aluminum-titanium-niobium alloy, prepn. of, by
phys. vapor deposition)

IT 106389-69-9P, Aluminum titanium nitride (AlTiN)

(composites with titanium aluminide, prepn. of, by **phys**
vapor deposition)

IT 133819-70-2P, Aluminum 53.4, niobium 3.3, titanium 43.3 (atomic)

(composites with titanium diboride, prepn. of, by **phys.**
vapor deposition)

L36 ANSWER 11 OF 12 HCA COPYRIGHT 2002 ACS

112:163887 Tool edges coated with multicomponent hard materials by
physical-vapor or plasma chemical-vapor deposition, and the coating
process applied. Lemmer, Oliver; Esser, Stefan; Leyendecker, Toni
(Fed. Rep. Ger.). Ger. Offen. DE 3825399 A1 19900125, 4 pp.
(German). CODEN: GWXXBX. APPLICATION: DE 1988-3825399 19880723.

AB The concn. of metals in the edge coating is .gtoreq.5 atom % higher
than that in other parts of the coating. In the coating process,
the elec. potential of plasma is selected such that tool edges act
as ion beam concentrators which results in the above difference in
metal concn. Thus, a drill was coated by a plasma chem-vapor
deposition using a sintered Al-Ti **target** in N atm. under
an elec. potential of -100 V between the plasma and the drill. The
drill edges were clearly more red-yellow colored than the remaining
dark grey areas, indicating a higher TiN concn. at the edges. The
Al concn. at the edges was .apprx.10% higher than in other areas.

IT 11106-92-6

(**targets**, in coating of cutting tool edges, by plasma
chem.-vapor deposition in nitrogen atm.)

RN 11106-92-6 HCA

CN Aluminum alloy, nonbase, Al,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
=====+=====	
Al	7429-90-5
Ti	7440-32-6

IC ICM C23C014-06

ICS C23C014-34; C23C016-30

ICA B23B027-00; B23C005-00; B21D028-00

CC 57-2 (Ceramics)

ST **deposition phys vapor** hard coating;
 plasma chem vapor deposition; tool cutting edge hard coating; drill
 edge hard coating; aluminum titanium plasma deposition tool

IT Drills
 (bits, coating of, with hard material, by plasma chem.- or
phys.-vapor deposition)

IT Tools
 (cutting, coating of, with hard material, by plasma chem.- or
phys.-vapor deposition)

IT **11106-92-6**
 (**targets**, in coating of cutting tool edges, by plasma
 chem.-vapor deposition in nitrogen atm.)

L36X ANSWER 12 OF 12 HCA COPYRIGHT 2002 ACS
 112:60872 Surface modification for tribology with PVD processes:
 problems and prospects. Ramalingam, S. (Prod. Cent., Univ.
 Minnesota, Minneapolis, MN, 55455, USA). Mater. Res. Soc. Symp.
 Proc., Volume Date 1988, 140 (New Mater. Approaches Tribol.), 465-76
 (English) 1989. CODEN: MRSPDH. ISSN: 0272-9172.

AB A composite Ni-Ti **target** was used in an arc-based
phys. vapor deposition (PVD) process to
 produce graded Ni-Ti coatings. The compn. of the coating was
 controlled by changing the arc track diam. on the individual metals
 in the composite **target**. The exptl. results are preceded
 by a review discussing PVD processes for enhanced wear resistance
 and coating failure at the coating/substrate interface. By
 gradually changing the compn. at the interface adhesion is improved.

IT **12683-48-6**
 (**phys. vapor deposition** of, with
 graded compn.)

RN 12683-48-6 HCA
 CN Nickel alloy, nonbase, Ni,Ti (9CI) (CA INDEX NAME)

Component	Component Registry Number
Ni	7440-02-0
Ti	7440-32-6

CC 56-6 (Nonferrous Metals and Alloys)
 ST **phys vapor deposition** compn control;
 nickel titanium graded coating deposition

IT **12683-48-6**
 (**phys. vapor deposition** of, with
 graded compn.)